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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroaki Takehara

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EXAMINER

MCCRACKEN, DANIEL

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/559,827	Applicant(s) TAKEHARA, HIROAKI	
	Examiner DANIEL C. MCCracken	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-18, 21, 22 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-18, 21, 22 and 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Citation to the Specification will be in the following format: (S. # : ¶/L) where # denotes the page number and ¶/L denotes the paragraph number or line number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

Response to Arguments, Remarks**IDS**

JP 6-507879 has been considered, but only to the extent the alleged English counterpart indicates. To be clear, the Examiner does not speak or read Japanese, and as such any Japanese documents submitted have been considered only to the extent any translated portions or drawings would permit.

Drawings

Upon reconsideration, the objection to the drawings is WITHDRAWN. The rules for the content of drawings are set forth in 37 C.F.R. § 1.83, which states *inter alia*:

(b) When the invention consists of an improvement *on an old machine* the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

37 C.F.R. 1.83(b) (emphasis added). Because Applicants are claiming a method versus an apparatus or a machine, the objection was improvidently made. That said, Applicants are on notice that at least this Examiner would object to the drawings in any continuation of this case

Art Unit: 1793

claiming a reactor on the grounds that the improved portion is not shown. Clearly, it is very similar if not identical to the Alford/TDA Research device.

Claim Rejections – 35 U.S.C. §112

Applicants amendments to Claims 13 and 15-16 (as well as claims depending therefrom) obviate the amendment. Accordingly, the rejection is WITHDRAWN.

Claim Rejections – 35 U.S.C. §§ 102-103

Applicant has amended independent Claim 13 to recite limitations not found in the original claims as rejected, specifically the velocity range and the C/O ratio. Furthermore, Applicant has submitted priority documents that admittedly do not support some of their claims in an attempt to disqualify some prior art. The claims define the invention. 35 U.S.C. 112, ¶2. As the claims are now drawn to a different invention, all rejections are WITHDRAWN. New rejections appear forthwith. Priority is addressed, as necessary, *infra*.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. The references cited teach each and every limitation of the rejected claims. The pinpoint citations are in no way to be construed as limitations of the teachings of the reference, but rather illustrative of particular instances where the teachings may be found.

Art Unit: 1793

Claims 13-16, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,273,729 to Howard, et al.

With respect to Claim 13-14, Howard teaches a flame synthesis technique for making fullerenes. Howard discloses a range of velocities, but explicitly states that “on an industrial scale, gas velocities could be much higher.” (Howard 2: 49-51). This teaching is especially relevant given the fact that fullerenes were produced on an industrial scale at the time of this invention, as evidenced by Applicants remarks that they bought their reactor from a commercial supplier (Alford/TDA). Running a plant at greater throughput is obvious to the skilled artisan for any number of reasons, for example *making money!* Howard teaches a C/O ratio of 1.07. *See e.g.* (Howard 2: 47). A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). To the extent this is not persuasive, note that Howard explicitly states that “[i]n order to provide more flexibility, a stable flame can be established with C/O ratio . . . and gas velocity adjusted *so as to optimize fullerene yield.*” (Howard 2: 60-63) (emphasis). Optimization - even when the prior art doesn’t tell you to do so - does not impart patentability. *In re Boesch*, 205 USPQ 215, 219 (CCPA 1980). With respect to Claims 15-16, Applicants disclose the ranges disclosed by Howard. *Compare* (S. 21: [0023], “Tables 1-4”) *with* (Howard “Table 1”). If you run the process of Howard in the manner suggested by Howard (i.e. with higher velocities), you would arrive at the claimed limitations. Note that Howard recognized low pressure as favorable for fullerene formation, long before Applicants. (Howard 6: 33-35) (“For example the results reported in Table 3 suggested that lowering pressure improved C₆₀ + C₇₀

Art Unit: 1793

yields.”). Applicants multiplication of two known result-effective variables demonstrates nothing more than they know how to multiply. As to Claim 24, pure oxygen is reasonably suggested. (Howard 3: 29). As to Claim 28, the C/O ratio controls soot formation. Given that the C/O ratio is taught, it is expected the fullerene/soot ratio is also taught.

Claims 13-18, 21-22, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,273,729 to Howard, et al. as applied to claims 13-16 and 24 above, and further in view of US 2004/0057896 to Kronholm, et al. Note Kronholm is 102(e) art, regardless of what date Applicants are entitled to (US or Japan).

The preceding discussion of Howard accompanying the obviousness rejection *supra* is expressly incorporated herein by reference. With respect to Claims 17-18 and 21-22, Kronholm note that Kronholm teaches the claimed separation scheme. *See generally* (Kronholm “Figs”). Note that Kronholm teaches a condenser coil to cool the exhaust (i.e. Applicants “swirling flow in a pipe”). (Kronholm 7: [0073]).

Claims 13-18, 21-22, 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard and Kronholm as applied above, and further in view of US 5,985,232 to Howard, et al.

The preceding discussion of Howard and Kronholm above are expressly incorporated herein by reference. With respect to Claims 25-26, to the extent neither Howard or Kronholm

Art Unit: 1793

may not disclose preheating the hydrocarbon, this practice is old and known. The Examiner takes official notice that it is. In support of taking official notice (i.e. in making sure there is “substantial evidence” on the record), the Examiner provides Howard ‘232. *See* (Howard ‘232 6: 47-49) (“Preheating of the combustion mixture may be desired in some situations.”).

Claims 13-18, 21-22 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard ‘729, Kronholm and Howard ‘232 as applied above, and further in view of US 2003/0041732 to Alford, et al. Note Alford is 102(e) art.

The preceding discussion of both Howard patents and Kronholm above are expressly incorporated herein by reference. With respect to Claim 27, orientation of the reactor is an obvious design choice. To the extent one of ordinary skill in the art would not recognize this, Alford conveniently provides ample motivation to arrange the reactor as claimed. *See* (Alford 6: [0053]) (“This is especially useful for horizontal or downflowing synthesis methods, ***as gravity assists the product into the receptor or collector.***”) (emphasis added).

Furthermore, to the extent Kronholm may not disclose whatever separation scheme Applicants are trying to Claim, it is quite clearly lifted from Alford. *Compare* (S. "Figs") *with* (Alford "Fig. 2"). The Examiner considers this to be very strong ***secondary indicia of obviousness***. “A person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR International Co. v. Teleflex, Inc.*, 550 US ___, 82 USPQ2d 1385, 1397 (2007). Using known synthesis techniques (i.e. flame synthissis/Kronholm) and known separation techniques (Alford) in a predictable manner is not inventive.

Art Unit: 1793

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL C. MCCracken whose telephone number is (571)272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/
Daniel C. McCracken
Examiner, Art Unit 1793
DCM

/Stuart Hendrickson/
Stuart L. Hendrickson
Primary Examiner